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(54) **FULL-AUDIO-RANGE SPEAKER**

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H04R 7/04 (2006.01)
H04R 1/26 (2006.01)

(52) **U.S. Cl.**
CPC . ***H04R 7/045*** (2013.01); ***H04R 1/26*** (2013.01)

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USPC 381/152, 182, 184, 345, 386, 431; 181/198, 199
See application file for complete search history.

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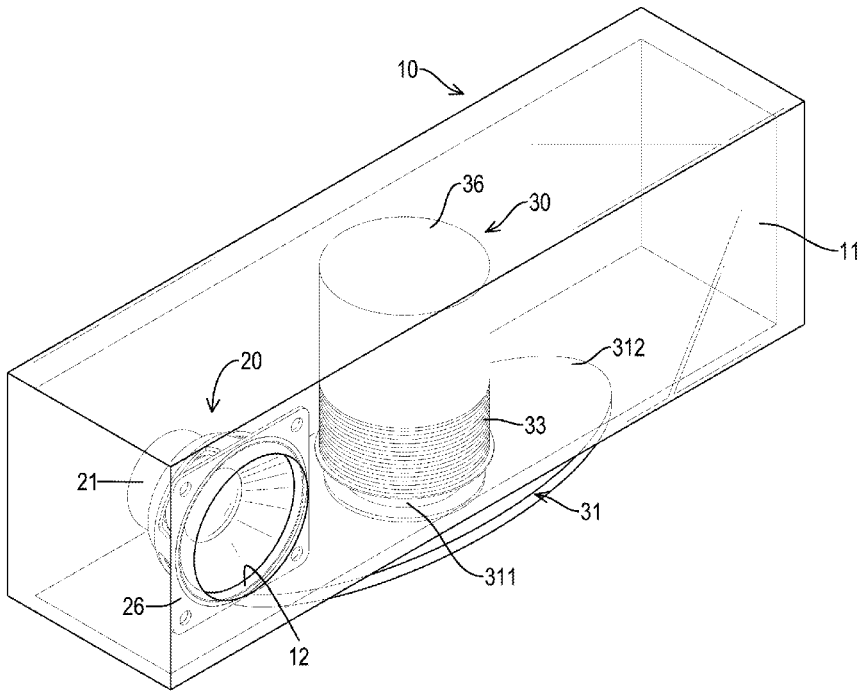
(57) **ABSTRACT**

A full-audio-range speaker has a box, at least one dynamic speaker unit, and a vibration speaker. The box has multiple side walls and at least one wall hole. The at least one dynamic speaker unit is mounted in the box and has a sound hole aligned with the at least one wall hole. The vibration speaker is mounted through the box. The at least one dynamic speaker unit and the vibration speaker respectively improve midrange, treble, and bass performances of the full-audio-range speaker. Therefore, the full-audio-range speaker can have relatively good midrange, treble, and bass performances simultaneously.

20 Claims, 10 Drawing Sheets



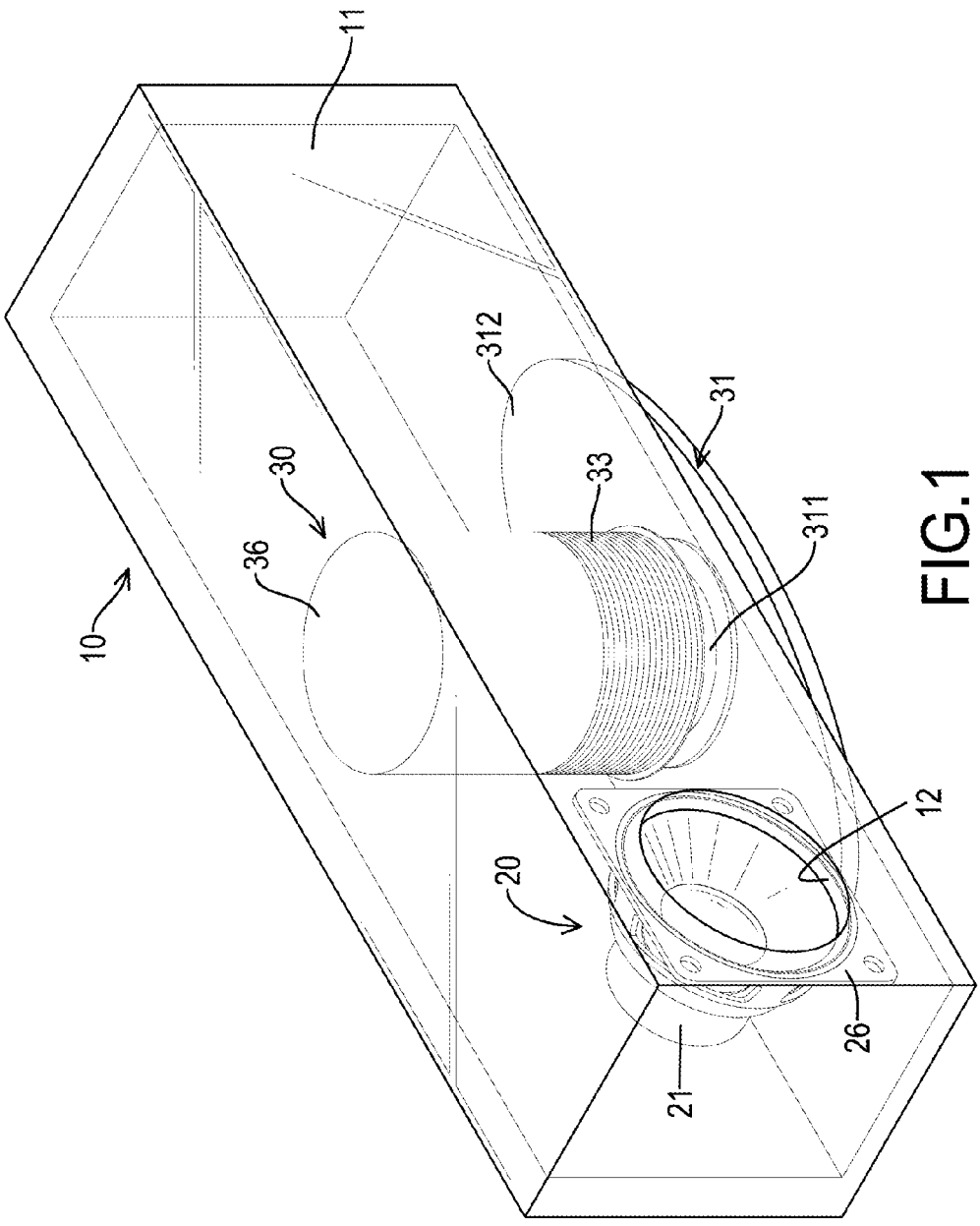


FIG.1

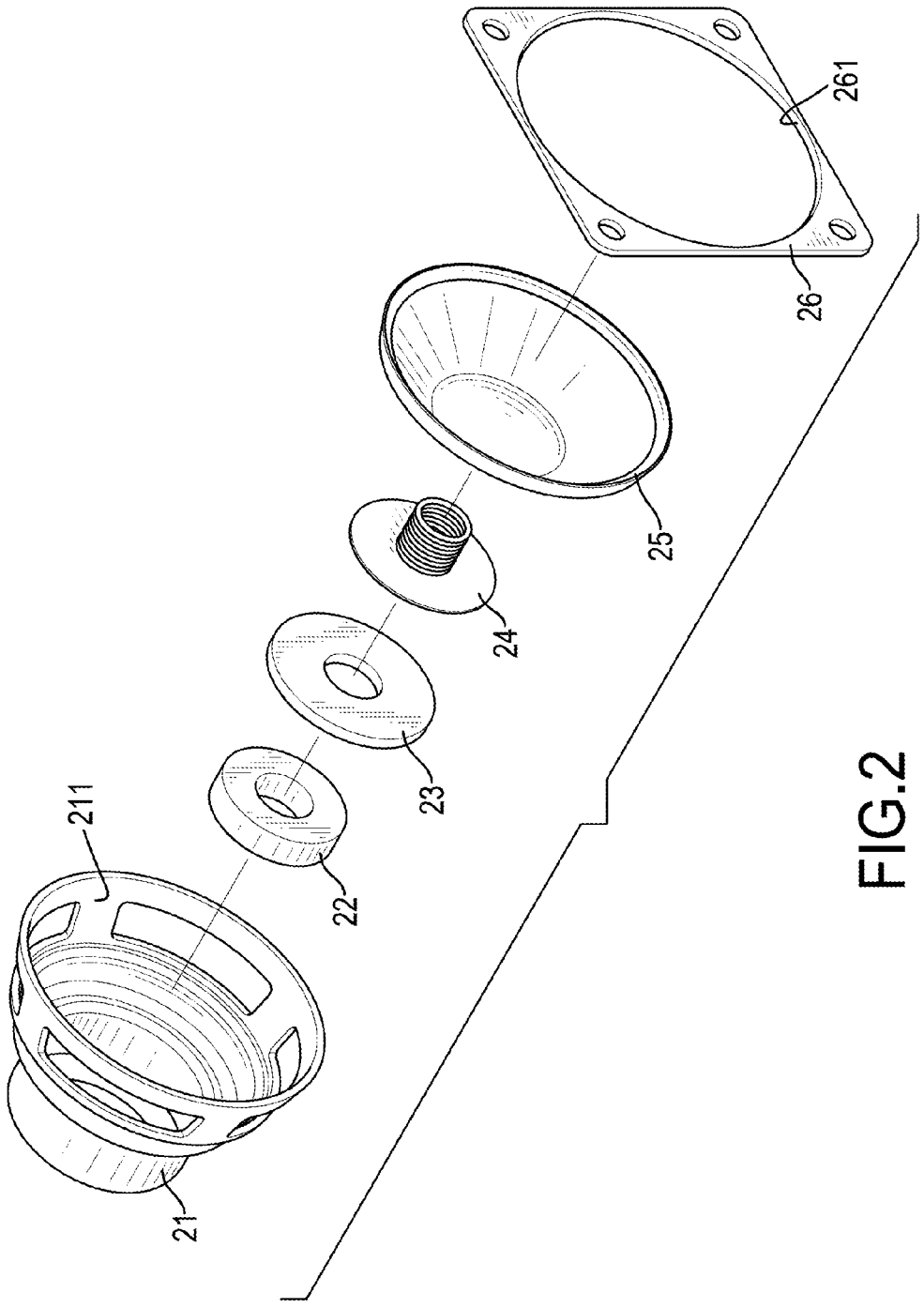


FIG.2

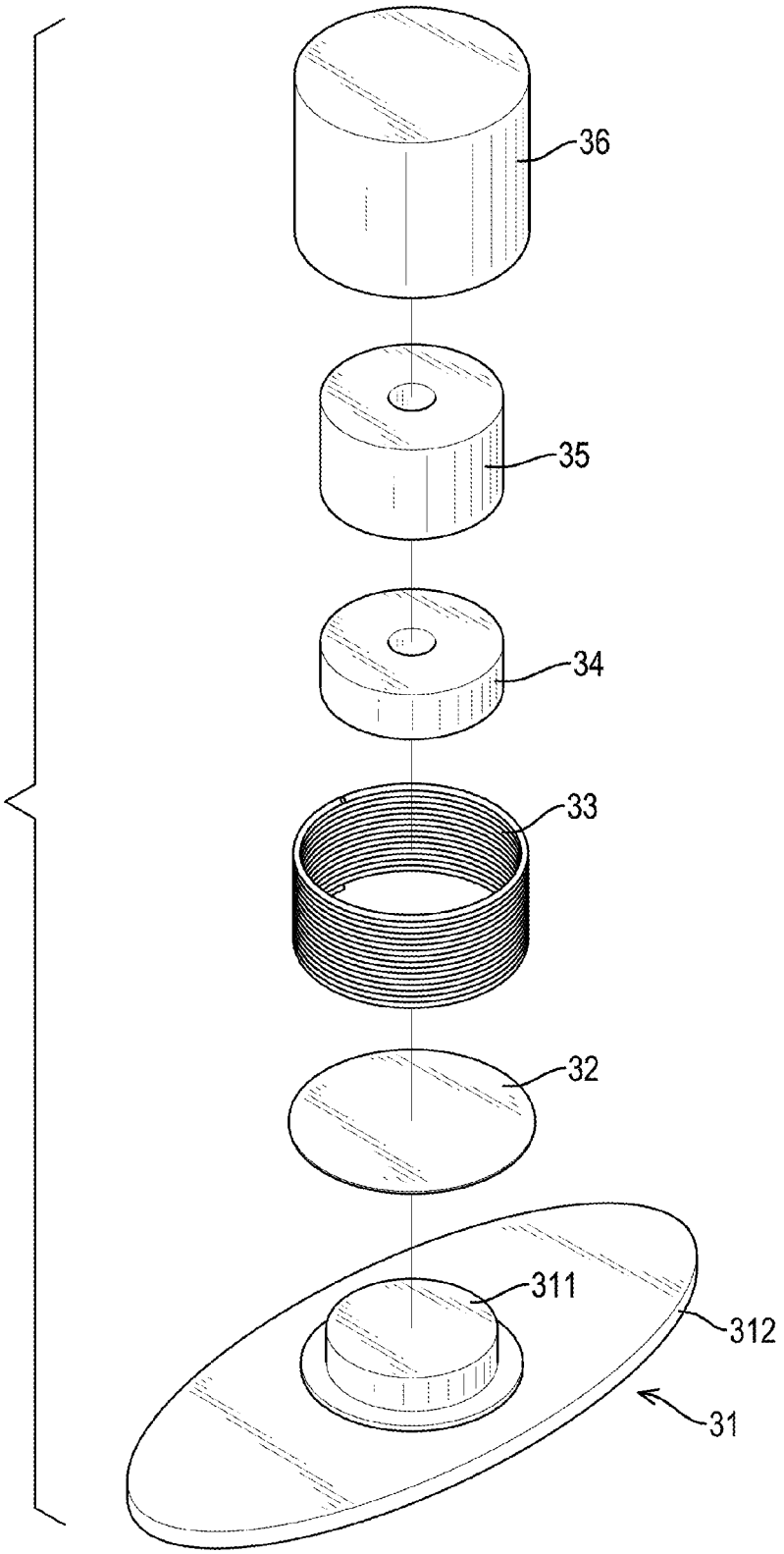


FIG.3

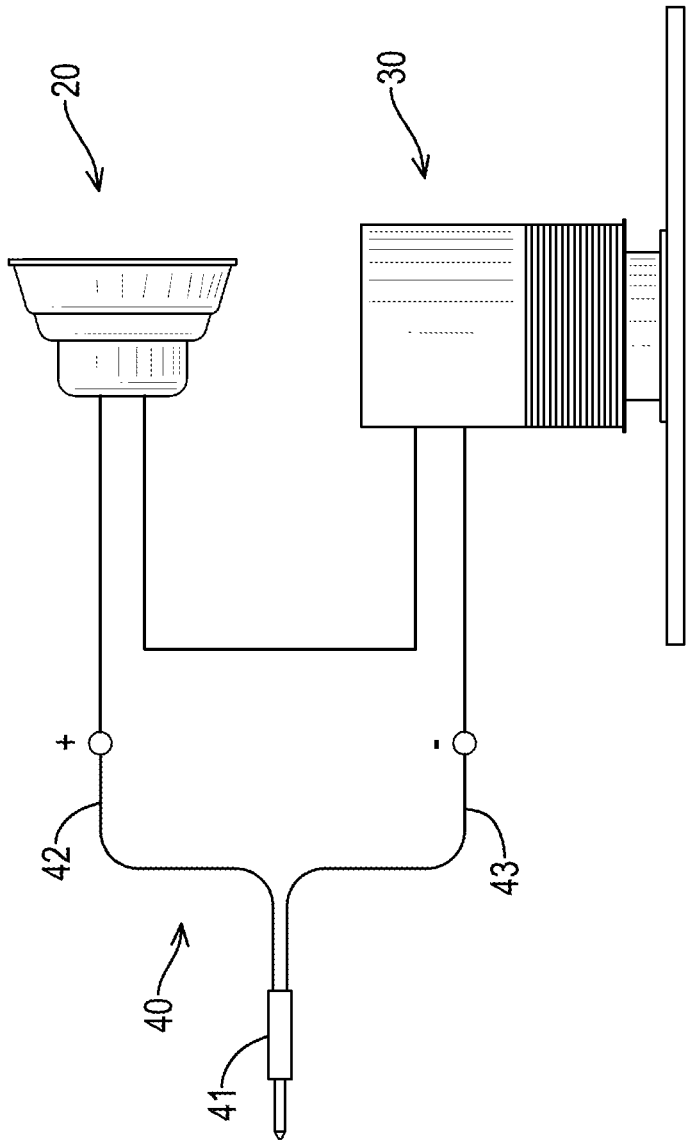


FIG.4A

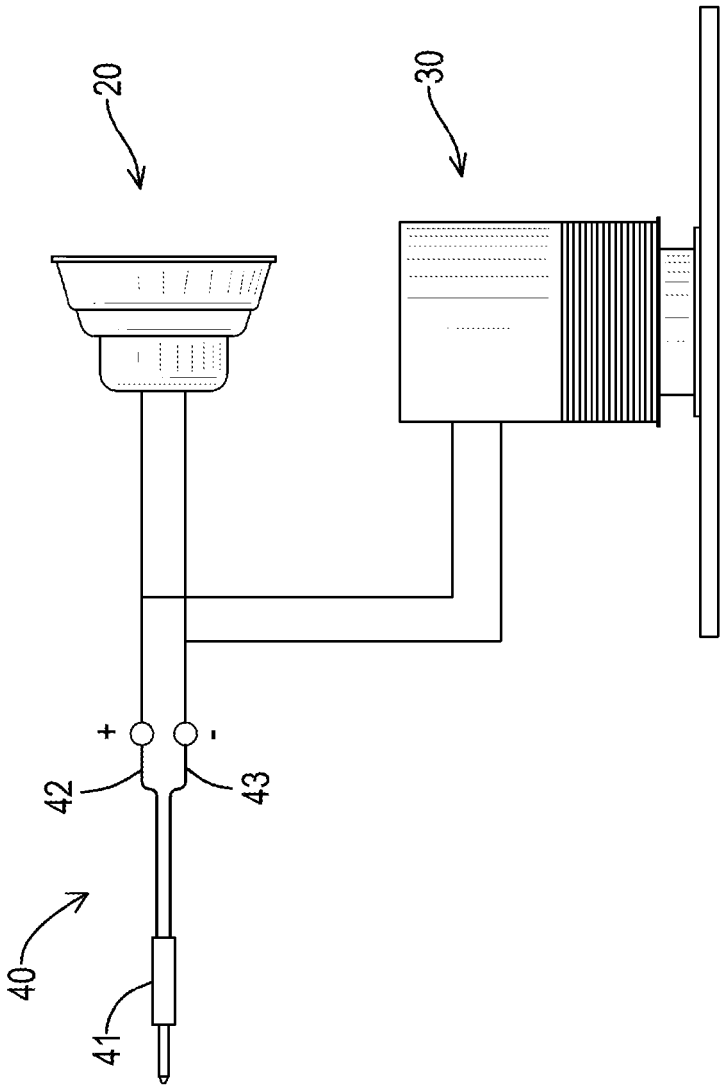


FIG.4B

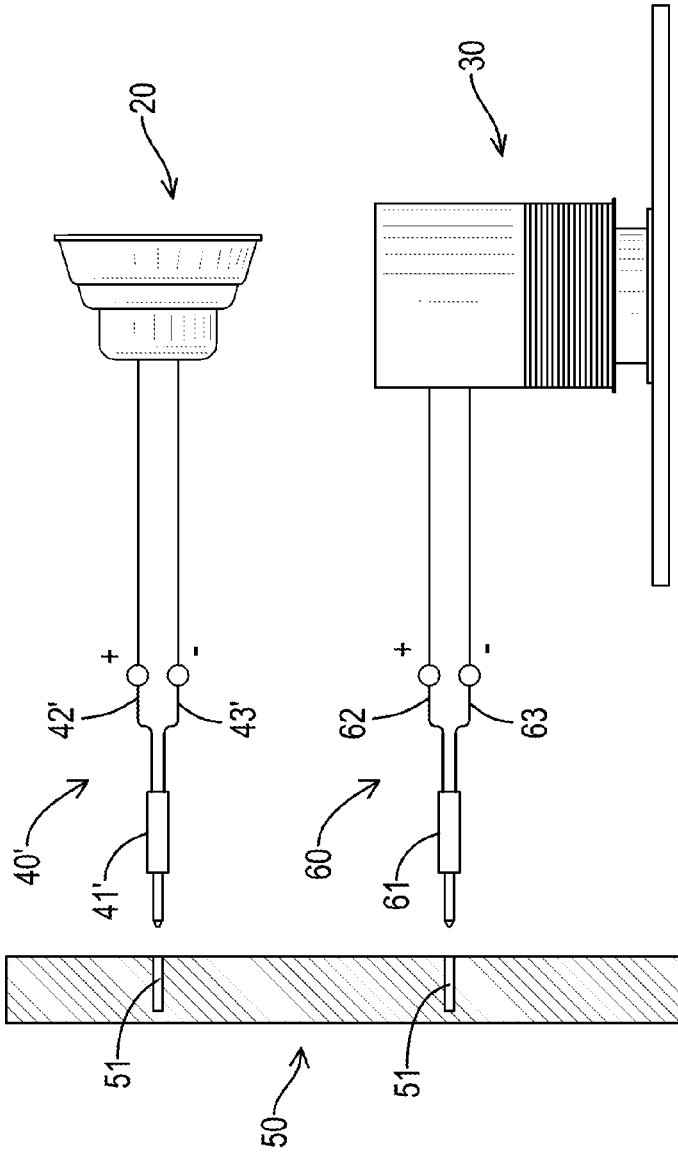


FIG.4C

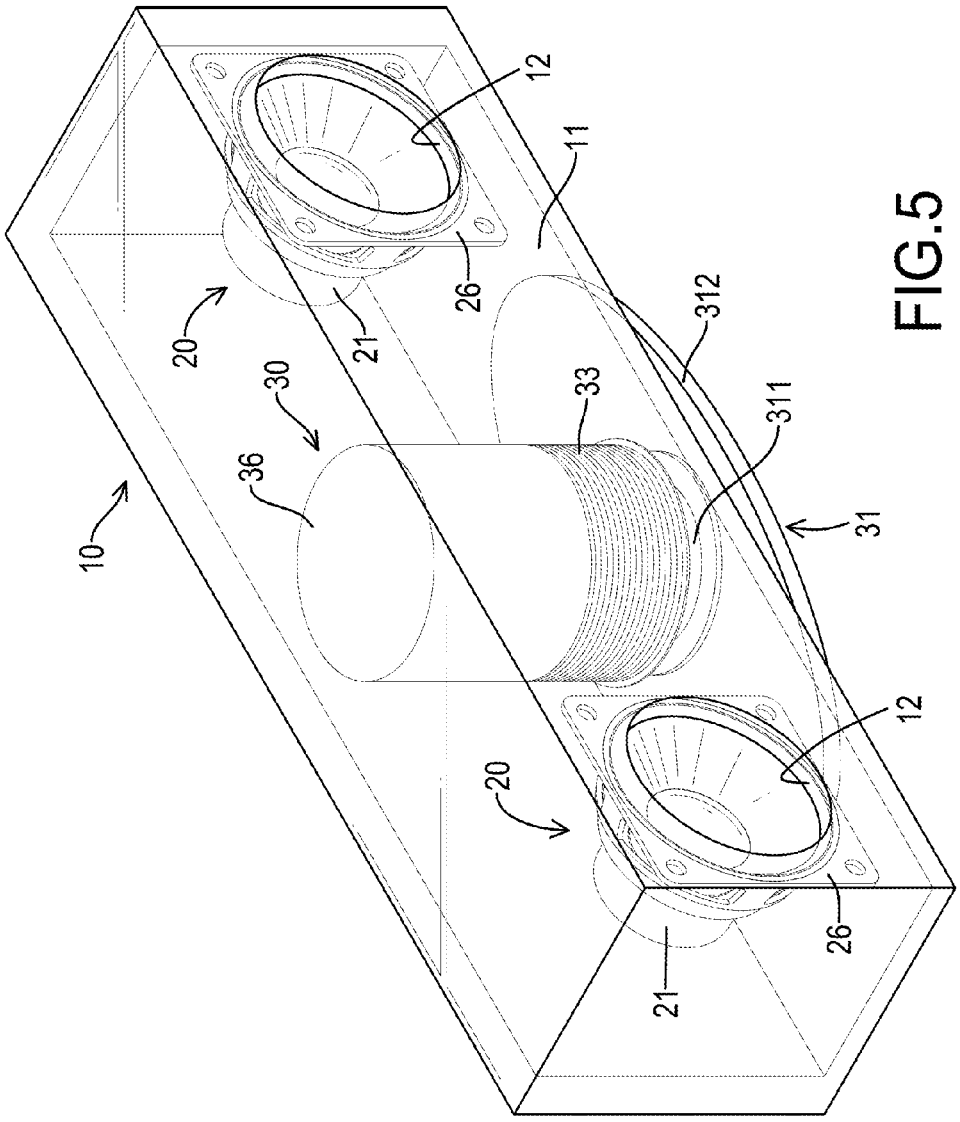


FIG.5

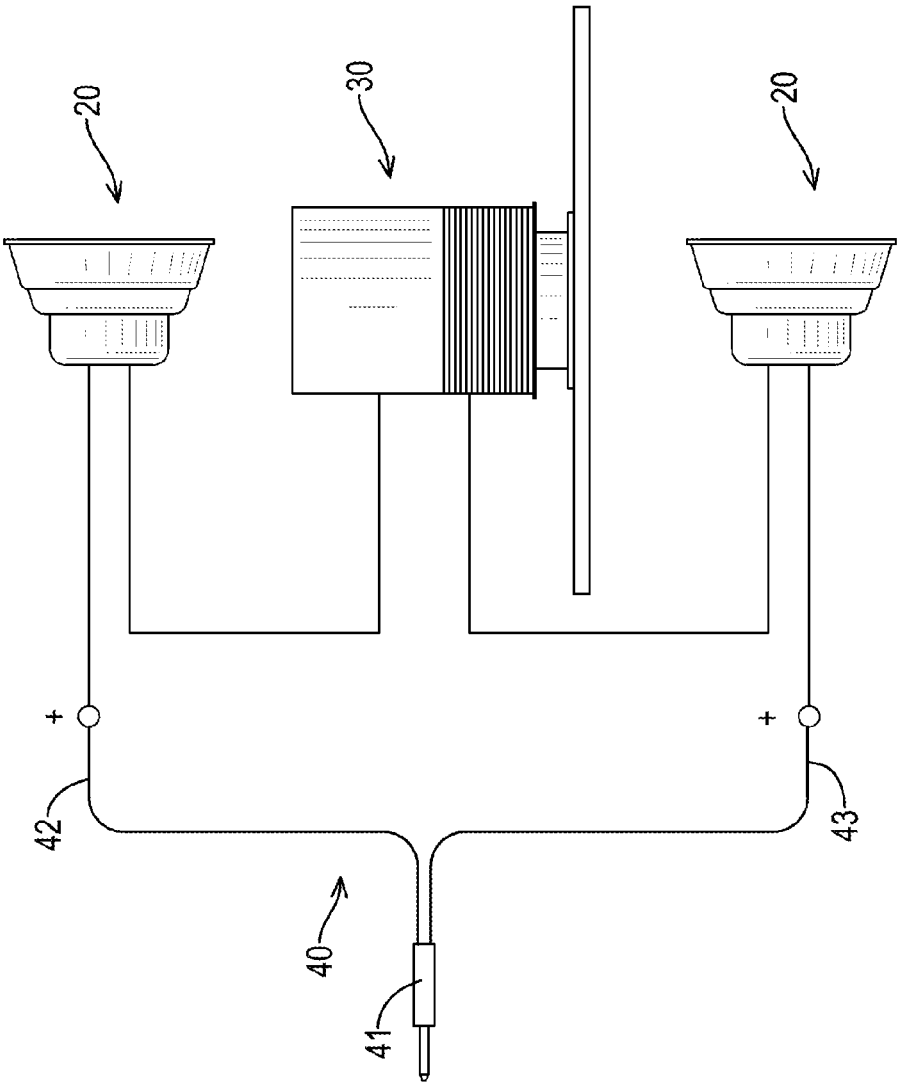


FIG.6A

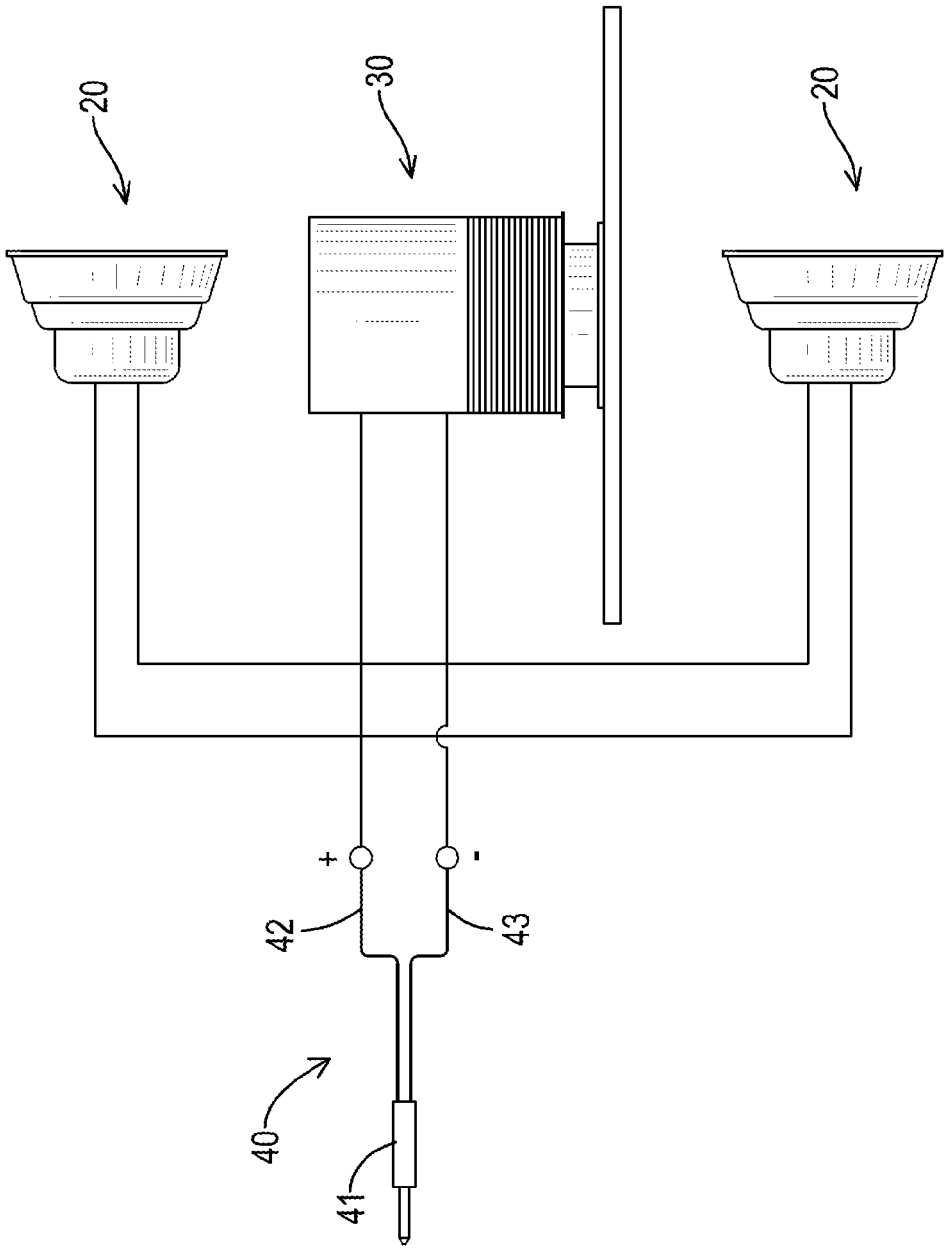


FIG.6B

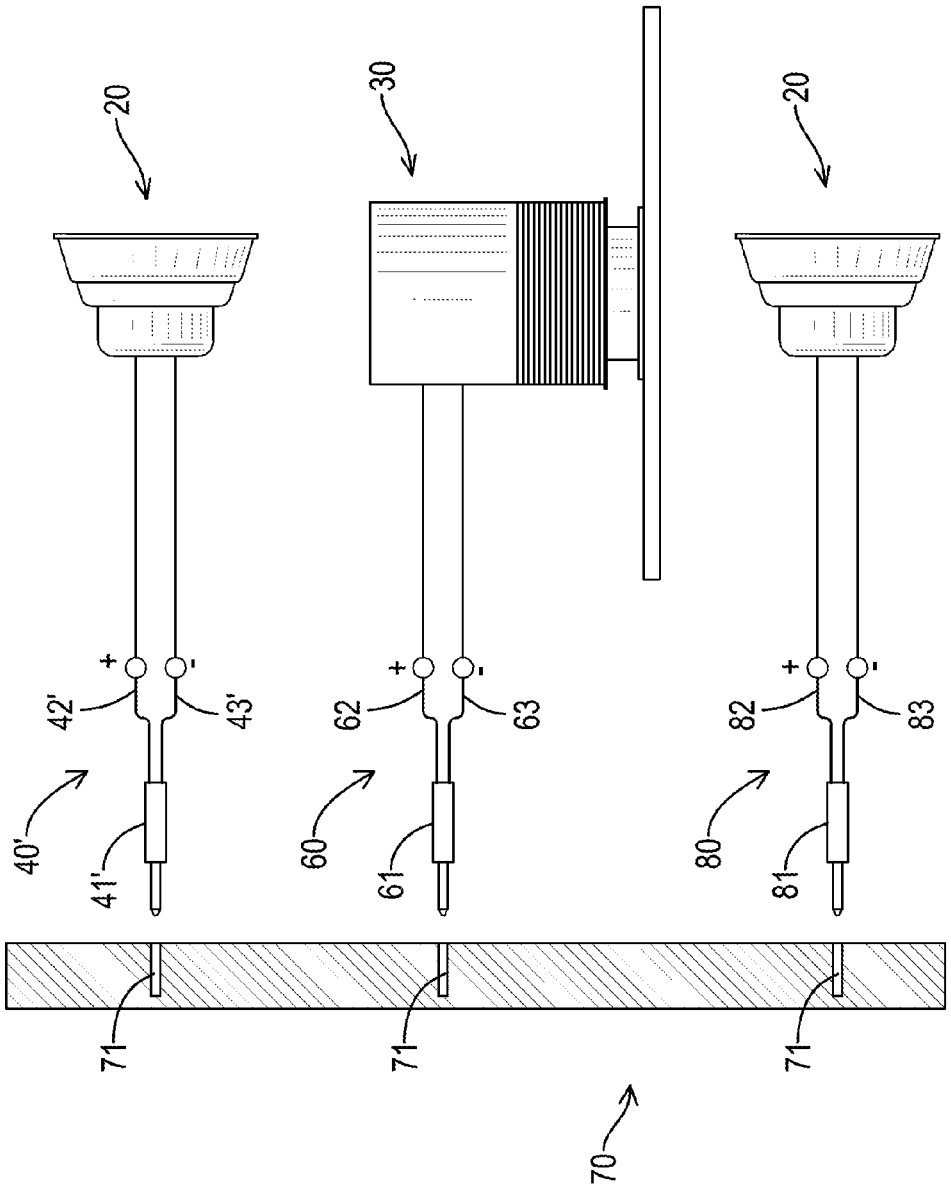


FIG.6C

FULL-AUDIO-RANGE SPEAKER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a speaker and more particularly to a full-audio-range speaker that is capable of full audio range performance in the bass, midrange, and treble frequency regions.

2. Description of Related Art

Speakers are devices for transforming electronic signals into sounds, wherein dynamic speakers are one of the most common types of the speakers. A dynamic speaker comprises a dynamic speaker unit and a box. The dynamic speaker unit is mounted in the box and has a coil, a magnet and a diaphragm, wherein the coil, the magnet and the diaphragm are stacked together. When the dynamic speaker receives an audio signal, the coil generates a magnetic field based on the audio signal. The coil is attracted or repulsed by the magnet and vibrates. The diaphragm vibrates with the coil and causes an air vibration to generate sounds. The box resonates with the sounds and enhances bass performance.

Generally, the bass performance of the dynamic speaker depends on a volume of the box. The bass performance of the dynamic speaker can be improved by expanding the volume of the box. However, when the volume of the box is too large, the dynamic speaker is hard to move or store, hence causing inconvenience to users. Therefore, most dynamic speakers are manufactured small and have poor bass performances.

Vibration speakers are another type of the speakers, and a vibration speaker comprises a coil and a magnet. When using the vibration speaker, the vibration speaker has to firmly contact a medium, such as a wooden table, glass, wall, metal, etc. The vibration speaker receives an audio signal, and the coil generates a magnetic field based on the audio signal. The coil is attracted or repulsed by the magnet and vibrates, thereby making the vibration speaker vibrate. The medium contacted with the vibration speaker also vibrates and causes an air vibration to generate sounds.

Generally, sound effect of the vibration speaker depends on the medium that contacts the vibration speaker. When the medium is a wooden table, glass, wall or metal, bass performance of the vibration speaker is relatively good, but midrange and treble performances of the vibration speaker are relatively poor. When the medium is stone or the ground, the midrange and the treble performances of the vibration speaker are relatively good, but the bass performance of the vibration speaker is poor.

In conclusion, the vibration speaker does not have a box compared to the dynamic speaker, thus, a volume of the vibration speaker is usually smaller than a volume of the dynamic speaker. Disadvantage of the vibration speaker is that the vibration speaker cannot have good bass, midrange and treble performances at the same time.

SUMMARY OF THE INVENTION

The main objective of the invention is to provide a full-audio-range speaker capable of full audio range performance in the bass, midrange, and treble frequency regions at the same time.

The full-audio-range speaker comprises a box, at least one dynamic speaker unit, and a vibration speaker. The box has multiple side walls and at least one wall hole formed through one of the multiple side walls. The at least one dynamic speaker unit is mounted in the box, wherein the at least one dynamic speaker unit has a sound hole aligned with the at least one wall hole. The vibration speaker is mounted through the box and has a T-shaped base. The T-shaped base has a pillar and a bottom board, wherein the pillar is mounted through one of the multiple side walls that does not have the at least one wall hole and has two ends respectively located inside and outside the box. The bottom board is connected to one of the two ends of the pillar that is outside the box.

The full-audio-range speaker in accordance with the present invention is adapted for being electrically connected to an audio device and mounted on a medium. When the audio device outputs an audio signal to the audio device, the at least one dynamic speaker unit receives the audio signal and generates sounds based on the audio signal, and the vibration speaker also receives the audio signal and vibrates based on the audio signal. The medium vibrates with the vibration speaker causing an air vibration to generate sounds.

When a user of the full-audio-range speaker needs to emphasize bass performance of the full-audio-range speaker, the user can choose glass, wall or metal as the medium for contact with the full-audio-range speaker, thus, the vibration speaker of the full-audio-range speaker can have better bass performance, so as to improve the overall bass performance of the full-audio-range speaker. Simultaneously, the full-audio-range speaker can also have good midrange and treble performances by the at least one dynamic speaker unit.

In conclusion, the full-audio-range in accordance with the present invention has good performance in all audio ranges by the at least one dynamic speaker unit and the vibration speaker. Furthermore, the bass performance of the full-audio-range speaker is improved by the vibration speaker, and the at least one dynamic speaker unit only needs to focus on midrange and treble performances, that is, the full-audio-range speaker can have good bass performance with a relatively small box compared to a conventional dynamic speaker. Therefore, the full-audio-range speaker can be further decreased in volume and can be easily stored and carried by a user.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a first preferred embodiment of a full-audio-range speaker in accordance with the present invention;

FIG. **2** is an exploded view of a dynamic speaker unit of the full-audio-range speaker in FIG. **1**;

FIG. **3** is an exploded view of a vibration speaker of the full-audio-range speaker in FIG. **1**;

FIG. **4**A is a circuit diagram of the full-audio-range speaker in FIG. **1** having an audio cable;

FIG. **4**B is another circuit diagram of the full-audio-range speaker in FIG. **1** having an audio cable;

FIG. **4**C is a circuit diagram of the full-audio-range speaker in FIG. **1** having two audio cables;

FIG. **5** is a perspective view of a second preferred embodiment of a full-audio-range speaker in accordance with the present invention;

FIG. **6**A is a circuit diagram of the full-audio-range speaker in FIG. **5** having an audio cable;

FIG. **6**B is another circuit diagram of the full-audio-range speaker in FIG. **5** having an audio cable; and

FIG. **6**C is another circuit diagram of the full-audio-range speaker in FIG. **5** having three audio cables.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to FIG. **1**, a first preferred embodiment of a full-audio-range speaker in accordance with the present invention comprises a box **10**, a dynamic speaker unit **20** and a vibration speaker **30**.

The box **10** is a rectangle and has multiple side walls **11** and a wall hole **12**, wherein the wall hole **12** is formed through one of the multiple side walls **11**.

With reference to FIGS. **1** and **2**, the dynamic speaker unit **20** is mounted in the box **10** and has a speaker housing **21**, a first magnet **22**, a first magnetoconductive plate **23**, a first coil **24**, a diaphragm basin **25** and a fixing board **26**.

The speaker housing **21** has a first end **211**, a second end **212** and a sound hole **213**, wherein the sound hole **213** is formed at the first end **211** and aligned with the wall hole **12** of the box **10**.

The first magnet **22** is mounted in the second end **212** and has a first surface and a second surface, wherein the first surface of the first magnet **22** faces toward the sound hole **213**.

The first magneto conductive plate **23** is mounted in the second end **212** and is located above the first magnet **22**, wherein the first magneto conductive plate **23** has a first surface and a second surface. The first surface of the first magneto conductive plate **23** faces toward the sound hole **213**, and the second surface of the first magneto conductive plate **23** faces toward the first surface of the first magnet **22** to increase speed of magnetic conduction and sensitivity of magnetization.

The first coil **24** is mounted on the first surface of the first magnetoconductive plate **23** and adapted for being electrically connected to an external audio device. The first coil **24** receives audio signals from an external audio device and generates a magnetic field based on the audio signals, and then the first coil **24** is attracted or repulsed by the first magnet **22** and vibrates.

The diaphragm basin **25** is mounted in the speaker housing **21** and on the first coil **24**. When the first coil **24** vibrates, the diaphragm basin **25** vibrates with the first coil **24**, causing an air vibration to generate sounds.

The fixing board **26** is mounted on one of the multiple side walls **11** of the box **10** that has the wall hole **12**, and the fixing board **26** has a fixing hole **261** aligned with the wall hole **12**. An inner diameter of the fixing hole **261** is larger than an outer diameter of the diaphragm basin **25**, such that the diaphragm basin **25** is mounted in the fixing hole **261** to fix the dynamic speaker unit **20** in the box **10**.

With reference to FIGS. **1** and **3**, the vibration speaker **30** has a T-shaped base **31**, a flexible metal panel **32**, a second coil **33**, a second magneto conductive plate **34**, a second magnet **35** and a metal cap **36**.

The T-shaped base **31** has a pillar **311** and a bottom board **312**. The pillar **311** is mounted through one of the multiple side walls **11** that does not have the wall hole **12**, and the pillar **311** has two ends respectively located inside and outside the box **10**. The bottom board **312** is connected to one of the two ends of the pillar **311** that is outside the box **10**, wherein the bottom board **312** is adapted for contact with a medium.

The flexible metal panel **32** is mounted on one of the two ends of the pillar **311** that is inside the box **10**. The flexible metal panel **32** is made of flexible metal, thus, the flexible metal panel **32** can increase vibration amplitude of the vibration speaker **30** to transfer vibration force to the medium effectively.

The second coil **33** is mounted on the flexible metal panel **32** and adapted for being electrically connected to the external audio device. The second coil **33** receives audio signals from the external audio device and generates a magnetic field based on the audio signals.

The second magneto conductive plate **34** is mounted in the second coil **33** to increase speed of magnetic conduction and sensitivity of magnetization.

The second magnet **35** is mounted in the second coil **33** and on the second magneto conductive plate **34**. When the second coil **33** generates a magnetic field, the second coil **33** and the second magnet **35** interact and generate the vibration force in an axial direction of the pillar **311**.

The metal cap **36** is mounted on the second coil **33** to increase a weight of the vibration speaker **30**. Thus, the bottom board **312** contacts the medium relatively tighter due to the increased weight of the vibration speaker **30** to transfer vibration force to the medium effectively.

In order to be compatible with a mobile device such as a cell phone, a MP3 or a handheld video game device having only an audio port, with reference to FIGS. **4**A and **4**B, the first preferred embodiment of the full-audio-range speaker in accordance with the present invention further comprises an audio cable **40** having an audio connecter **41**, a signal cable **42** and a ground cable **43**.

With reference to FIG. **4**A, a connection between the dynamic speaker unit **20**, the vibration speaker **30** and the audio cable **40** is shown, and the dynamic speaker unit **20** and the vibration speaker **30** each have a signal terminal and a ground terminal. The signal cable **42** is electrically connected to the audio connecter **41** and the signal terminal of the dynamic speaker unit **20**. The ground terminal of the dynamic speaker unit **20** is electrically connected to the signal terminal of the vibration speaker **30**. The ground cable **43** is electrically connected to the audio connecter **41** and the ground terminal of the vibration speaker **30**, that is, the dynamic speaker unit **20** and the vibration speaker **30** are connected in series.

With reference to FIG. **4**B, another connection between the dynamic speaker unit **20**, the vibration speaker **30** and the audio cable **40** is shown. The signal cable **42** is electrically connected to the audio connecter **41**, the signal terminal of the dynamic speaker unit **20**, and the signal terminal of the vibration speaker **30**. The ground cable **43** is electrically connected to the audio connecter **41**, the ground terminal of the dynamic speaker unit **20**, and the ground terminal of the vibration speaker **30**, that is, the dynamic speaker unit **20** and the vibration speaker **30** are connected in parallel.

Furthermore, a dual-audio device **50** (1.1 audio interface) is shown in FIG. **4**C and has two audio ports **51** to output sounds in dual audio channels. In order to be compatible with the dual-audio device **50**, the first preferred embodiment of the full-audio-range speaker in accordance with the present invention further comprises a first audio cable **40'** and a second audio cable **60**.

The first audio cable **40'** has an audio connecter **41'**, a signal cable **42'** and a ground cable **43'**. The signal cable **42'** is electrically connected to the audio connecter **41'** and the signal terminal of the dynamic speaker unit **20**. The ground cable **43'** is electrically connected to the audio connecter **41'** and the ground terminal of the dynamic speaker unit **20**.

The second audio cable **60** has an audio connecter **61**, a signal cable **62** and a ground cable **63**. The signal cable **62** is electrically connected to the audio connecter **61** and the signal terminal of the vibration speaker **30**. The ground cable **63** is electrically connected to the audio connecter **61** and the ground terminal of the vibration speaker **30**.

By the first audio cable **40'** and the second audio cable **60**, the dynamic speaker unit **20** and the vibration speaker **30** can respectively receive audio signals from the two audio ports **51** of the dual-audio device **50** to respectively generate sounds in dual audio channels.

As shown from the above paragraphs, when the first preferred embodiment of the full-audio-range speaker in accordance with the present invention contacts the medium, the

vibration speaker **30** has a relatively good bass performance, such that the dynamic speaker unit **20** and the vibration speaker **30** respectively improve midrange, treble, and bass performances of the full-audio-range speaker. Therefore, the full-audio-range speaker can have relatively good midrange, treble, and bass performances simultaneously compared to a conventional dynamic speaker or a conventional vibration speaker.

With reference to FIG. **5**, a second preferred embodiment of a full-audio-range speaker in accordance with the present invention comprises a box **10**, two dynamic speaker units **20** and a vibration speaker **30**. With reference to FIGS. **1** and **5**, a structure of the two dynamic speaker units **20** and the vibration speaker **30** in the second preferred embodiment and a structure of the dynamic speaker unit **20** and the vibration speaker **30** in the first preferred embodiment are same. Therefore, descriptions related to the structure of the two dynamic speaker units **20** and the vibration speaker **30** will not be repeated in following paragraphs.

The box **10** has multiple side walls **11** and two wall holes **12** formed through one of the multiple side walls **11**, wherein the two wall holes **12** are formed through both sides of said one of the side walls **11** and two sound holes **213** of the two dynamic speaker units **20** are respectively aligned with the two wall holes **12**. The vibration speaker **30** is mounted through the box **10** and between the two dynamic speaker units **20**.

In order to be compatible with a mobile device such as a cell phone, a MP3 or a handheld video game device having only one audio port, with reference to FIGS. **6**A and **6**B, the second preferred embodiment of the full-audio-range speaker in accordance with the present invention further comprises an audio cable **40** having an audio connecter **41**, a signal cable **42** and a ground cable **43**.

With reference to FIG. **6**A, a connection between the two dynamic speaker units **20**, the vibration speaker **30** and the audio cable **40** is shown. The signal cable **42** is electrically connected to the audio connecter **41** and the signal terminal of one of the two dynamic speaker units **20**, the ground terminal of said one of the two dynamic speaker units **20** is electrically connected to the signal terminal of the vibration speaker **30**. The ground terminal of the vibration speaker **30** is electrically connected to the signal terminal of the other dynamic speaker unit **20**, and the ground cable **43** is electrically connected to the audio connecter **41** and the ground terminal of said the other dynamic speaker unit **20**, that is, the two dynamic speaker units **20** and the vibration speaker **30** are connected in series.

With reference to FIG. **6**B, another connection between the two dynamic speaker units **20**, the vibration speaker **30** and the audio cable **40** is shown. The signal cable **42** is electrically connected to the audio connecter **41**, the two signal terminals of the two dynamic speaker units **20**, and the signal terminal of the vibration speaker **30**. The ground cable **43** is electrically connected to the audio connecter **41**, the two ground terminals of the two dynamic speaker units **20**, and the ground terminal of the vibration speaker **30**, that is, the two dynamic speaker units **20** and the vibration speaker **30** are connected in parallel.

Furthermore, a triple-audio device **70** (2.1 audio interface) is shown in FIG. **6**C and has three audio ports **71** to output sounds in three audio channels. In order to be compatible with the triple-audio device **70**, the second preferred embodiment of the full-audio-range speaker in accordance with the present invention further comprises a first audio cable **40'**, a second audio cable **60** and a third cable **80**.

The first audio cable **40'** has an audio connecter **41'**, a signal cable **42'** and a ground cable **43'**. The signal cable **42'** is electrically connected to the audio connecter **41'** and the signal terminal of one of the two dynamic speaker units **20**. The ground cable **43'** is electrically connected to the audio connecter **41'** and the ground terminal of said one of the two dynamic speaker units **20**.

The second audio cable **60** has an audio connecter **61**, a signal cable **62** and a ground cable **63**. The signal cable **62** is electrically connected to the audio connecter **61** and the signal terminal of the vibration speaker **30**. The ground cable **63** is electrically connected to the audio connecter **61** and the ground terminal of the vibration speaker **30**.

The third audio cable **80** has an audio connecter **81**, a signal cable **82** and a ground cable **83**. The signal cable **82** is electrically connected to the audio connecter **81** and the signal terminal of the other dynamic speaker unit **20**. The ground cable **83** is electrically connected to the audio connecter **81** and the ground terminal of said the other dynamic speaker unit **20**.

By the first audio cable **40'**, the second audio cable **60** and the third audio cable **80**, the two dynamic speaker units **20** and the vibration speaker **30** can respectively receive audio signals from the three audio ports **71** of the triple-audio device **70** to respectively generate sounds in three audio channels.

As shown from the above paragraphs, the second preferred embodiment of the full-audio-range speaker in accordance with the present invention has all advantages of the first preferred embodiment of the full-audio-range speaker. In addition, the second preferred embodiment of the full-audio-range speaker can be further compatible with the triple-audio device **70** by the first audio cable **40'**, the second audio cable **60** and the third audio cable **80**.

In conclusion, the full-audio-range speaker in accordance with the present invention has good performance in all audio ranges by the at least one dynamic speaker unit and the vibration speaker. Furthermore, the bass performance of the full-audio-range speaker is improved by the vibration speaker, and the at least one dynamic speaker unit only needs to focus on midrange and treble performance, that is, the full-audio-range speaker can have good bass performance with a relatively small box compared to a conventional dynamic speaker. Therefore, a volume of the full-audio-range speaker can be further decreased and the speaker can be easily stored and carried by a user.

Even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and features of the invention, the disclosure is illustrative only. Changes may be made in the details, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. A full-audio-range speaker comprising:

a box having

multiple side walls; and

at least one wall hole formed through one of the multiple side walls;

at least one dynamic speaker unit mounted in the box wherein each of the at least one dynamic speaker units has

a sound hole aligned with a corresponding wall hole of the at least one wall hole; and

a vibration speaker mounted through the box and having

a T-shaped base having

a pillar mounted through one of the multiple side walls that does not have the at least one wall hole and the pillar having

two ends respectively located inside and outside the box; and

a bottom board connected to one of the two ends of the pillar that is outside the box.

2. The full-audio-range speaker as claimed in claim **1**, wherein

the at least one dynamic speaker unit comprises a dynamic speaker unit; and

the at least one wall hole of the box comprises a wall hole.

3. The full-audio-range speaker as claimed in claim **2**, wherein

the dynamic speaker unit further comprises

a signal terminal; and

a ground terminal;

the vibration speaker further comprises

a signal terminal electrically connected to the ground terminal of the dynamic speaker unit; and

a ground terminal; and

the full-audio-range speaker further comprises

an audio cable having

an audio connecter;

a signal cable electrically connected to the audio connecter and the signal terminal of the dynamic speaker unit; and

a ground cable electrically connected to the audio connecter and the ground terminal of the vibration speaker.

4. The full-audio-range speaker as claimed in claim **2**, wherein

the dynamic speaker unit further comprises

a signal terminal; and

a ground terminal;

the vibration speaker further comprises

a signal terminal; and

a ground terminal; and

the full-audio-range speaker further comprises

an audio cable having

an audio connecter;

a signal cable electrically connected to the audio connecter, the signal terminal of the dynamic speaker unit, and the vibration speaker; and

a ground cable electrically connected to the audio connecter, the ground terminal of the dynamic speaker unit, and the ground terminal of the vibration speaker.

5. The full-audio-range speaker as claimed in claim **2**, wherein

the dynamic speaker unit further comprises

a signal terminal; and

a ground terminal;

the vibration speaker further comprises

a signal terminal; and

a ground terminal; and

the full-audio-range speaker further comprises

a first audio cable having

an audio connecter;

a signal cable electrically connected to the audio connecter and the signal terminal of the dynamic speaker unit; and

a ground cable electrically connected to the audio connecter and the ground terminal of the dynamic speaker unit; and

a second audio cable having

an audio connecter;

a signal cable electrically connected to the audio connecter of the second audio cable and the signal terminal of the vibration speaker; and

a ground cable electrically connected to the audio connecter of the second audio cable and the ground terminal of the vibration speaker.

6. The full-audio-range speaker as claimed in claim **2**, wherein

the dynamic speaker unit comprises

a speaker housing having

a first end, wherein the sound hole is formed at the first end; and

a second end;

a first magnet mounted in the second end of the speaker housing and having

a first surface facing toward the sound hole; and

a second surface;

a first coil mounted on the first surface of the first magnet; and

a diaphragm basin mounted in the speaker housing and on the first coil.

7. The full-audio-range speaker as claimed in claim **6**, wherein

the dynamic speaker unit further comprises

a first magneto conductive plate mounted between the first magnet and the first coil.

8. The full-audio-range speaker as claimed in claim **2**, wherein

the vibration speaker comprises

a flexible metal panel mounted on one of the two ends of the pillar that is inside the box;

a second coil mounted on the flexible metal panel; and

a second magnet mounted in the second coil.

9. The full-audio-range speaker as claimed in claim **8**, wherein

the vibration speaker further comprises

a metal cap mounted on the second coil.

10. The full-audio-range speaker as claimed in claim **1**, wherein

the at least one dynamic speaker unit comprises two dynamic speaker units; and

the at least one wall hole of the box comprises two wall holes.

11. The full-audio-range speaker as claimed in claim **10**, wherein

the two wall holes of the box are formed through both sides of said one of the multiple side walls that has the two wall holes; and

the vibration speaker is mounted between the two dynamic speaker units.

12. The full-audio-range speaker as claimed in claim **10**, wherein

each dynamic speaker unit of the two dynamic speaker units further comprises

a signal terminal; and

a ground terminal;

the vibration speaker further comprises

a signal terminal electrically connected to the ground terminal of one of the two dynamic speaker units; and

a ground terminal electrically connected to the signal terminal of the other of the two dynamic speaker units; and

the full-audio-range speaker further comprises

an audio cable having

an audio connecter;

a signal cable electrically connected to the audio connecter and the signal terminal of said one of the two dynamic speaker units; and

a ground cable electrically connected to the audio connecter and the ground terminal of the other dynamic speaker unit.

13. The full-audio-range speaker as claimed in claim **10**, wherein

each dynamic speaker unit of the two dynamic speaker units further comprises

a signal terminal; and

a ground terminal;

the vibration speaker further comprises

a signal terminal; and

a ground terminal; and

the full-audio-range speaker further comprises

an audio cable having

an audio connecter;

a signal cable electrically connected to the audio connecter, the two signal terminals of the two dynamic speaker units, and the signal terminal of the vibration speaker; and

a ground cable electrically connected to the audio connecter, the two ground terminals of the two dynamic speaker units, and the ground terminal of the vibration speaker.

14. The full-audio-range speaker as claimed in claim **10**, wherein

each dynamic speaker unit of the two dynamic speaker units further comprises

a signal terminal; and

a ground terminal;

the vibration speaker further comprises

a signal terminal; and

a ground terminal; and

the full-audio-range speaker further comprises

a first audio cable having

an audio connecter;

a signal cable electrically connected to the audio connecter and the signal terminal of one of the two dynamic speaker units; and

a ground cable electrically connected to the audio connecter and the ground terminal of said one of the two dynamic speaker units;

a second audio cable having

an audio connecter;

a signal cable electrically connected to the audio connecter of the second audio cable and the signal terminal of the other of the two dynamic speaker units; and

a ground cable electrically connected to the audio connecter of the second audio cable and the ground terminal of the other dynamic speaker unit; and

a third audio cable having

an audio connecter;

a signal cable electrically connected to the audio connecter of the third audio cable and the signal terminal of the vibration speaker; and

a ground cable electrically connected to the audio connecter of the third audio cable and the ground terminal of the vibration speaker.

15. The full-audio-range speaker as claimed in claim **10**, wherein

each dynamic speaker unit of the two dynamic speaker units comprises

a speaker housing having

a first end, wherein the sound hole is formed at the first end; and

a second end;

a first magnet mounted in the second end of the speaker housing and having

a first surface facing toward the sound hole; and

a second surface;

a first coil mounted on the first surface of the first magnet; and

a diaphragm basin mounted in the speaker housing and on the first coil.

16. The full-audio-range speaker as claimed in claim **15**, wherein

each dynamic speaker unit of the two dynamic speaker units comprises

a first magneto conductive plate mounted between the first magnet and the first coil.

17. The full-audio-range speaker as claimed in claim **10**, wherein

the vibration speaker comprises

a flexible metal panel mounted on one of the two ends of the pillar that is inside the box;

a second coil mounted on the flexible metal panel; and

a second magnet mounted in the second coil.

18. The full-audio-range speaker as claimed in claim **17**, wherein

the vibration speaker further comprises

a metal cap mounted on the second coil.

19. The full-audio-range speaker as claimed in claim **1**, wherein

each one of the at least one dynamic speaker unit comprises

a speaker housing having

a first end, wherein the sound hole is formed at the first end; and

a second end;

a first magnet mounted in the second end of the speaker housing and having

a first surface facing toward the sound hole; and

a second surface;

a first coil mounted on the first surface of the first magnet; and

a diaphragm basin mounted in the speaker housing and on the first coil.

20. The full-audio-range speaker as claimed in claim **1**, wherein

the vibration speaker comprises

a flexible metal panel mounted on one of the two ends of the pillar that is inside the box;

a second coil mounted on the flexible metal panel; and

a second magnet mounted in the second coil.

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